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## CARDIOVASCULAR FLASHLIGHT

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# Prenatal diagnosis of aorto-left ventricular tunnel: introducing the 'cockade sign'

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A foetal echocardiography was solicited in the 35th week of gestation for left ventricular (LV) hypertrophy and dilatation. It demonstrated a significant backflow from ascending aorta to the LV. Regurgitant flow was not generated through the aortic valve, but through a tunnel surrounding the aortic annulus (Panel A). This 'cockade sign'—seen as a double ring around the aortic annulus—can be seen at 2D or colour Doppler echocardiography and is suggestive for diagnosis of an aorto-left ventricular tunnel (ALVT, Panel B).

Postnatal echocardiography confirmed diagnosis, with a significant regurgitant flow into the LV through the ALVT (Panels C and D). Due to rapid progression of cardiac failure and progressive LV dilatation, the newborn was operated at the age of 18 days. Intraoperatively, an ALVT coursing over the right aortic cusp could be easily identified (Panels E and F). The entry and exit orifices of the tunnel were closed with xenopericardial patches. Left ventricular size and function normalized within a few days. At the age of 5 years the boy is asymptomatic with no medication and normal LV and aortic valve function.

Timely diagnosis and treatment of ALVT is important for warranting normalization of LV size and function. Aorto-left ventricular tunnel should be suspected when regurgitant flow into the LV is not originating from the aortic valve.

The 'cockade sign' suggests the presence of a tunnel beside the aortic annulus and is of additional help for making a correct diagnosis.

Panels A and B Prenatal echocardiography showing aorto-left ventricular tunnel adjacent to the left ventricular outflow tract, bypassing the aortic valve. Panels C and D Postnatal echocardiography (short- and long-axis view) showing aorto-left ventricular tunnel side-by-side the aortic valve forming typical cockade configuration. Panel E Surgical preparation of aorto-left ventricular tunnel and aortic valve. Panel F Right angled clamp probing aorto-left ventricular tunnel, bypassing the aortic valve. LV, left ventricle; LA, left atrium; Ao, Aorta ascendens; PA, pulmonary artery; \*\* aorto-left ventricular tunnel (ALVT).

Supplementary material is available at *European Heart Journal* online.

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